WHAT IS CLAIMED IS:

1. A data processing apparatus comprising:
a plurality of data processing boards;
a bus connecting the boards with each other; and
wherein each board comprises a communication utility for communicating data over the bus to another board through a plurality of channels, and wherein at least one of the channels has a user-redefinable configuration.

2. The apparatus of claim 1 wherein each channel has a configuration that is separately user-redefinable.

3. The apparatus of claim 1 wherein the at least one channel configuration is user-redefinable with one of a plurality of available configuration types.

4. The apparatus of claim 1 wherein the boards are VME boards, and wherein the bus is a VME bus.

5. The apparatus of claim 4 wherein the at least one channel configuration is user-redefinable with respect to at least one selected from the group consisting of: (1) a maximum data transfer size for the at least one channel, (2)a board memory allocation for the at least one channel, and (3) the conditions under which DMA is used by the at least one channel for data transfers across the bus.

6. The apparatus of claim 4 wherein the communication utility is user-redefinable with respect to the number of channels through which data is communicated.

7. A data processing apparatus comprising:
a first data processing board;
a second data processing board;
a bus connecting the boards with each other; and

wherein each board comprises a communication utility for communicating data over the bus to the other board, and wherein the communication utility communicates data according to a redefinable configuration such that a bus utilization percentage in a range from approximately 13% to approximately 25% is achieved for 8 Kbyte data transfers across the bus.

8. The apparatus of claim 7 wherein the boards are VME boards, and wherein the bus is a VME bus.

9. The apparatus of claim 7 wherein the communication utility is configured to communicate data through a plurality of channels, wherein at least one channel has a user-redefinable configuration.

10. The apparatus of claim 9 wherein each channel's configuration is separately user-redefinable.

11. The apparatus of claim 9 wherein at least one channel's configuration is user-redefinable with one of a plurality of available configuration types.

12. The apparatus of claim 11 wherein each channel's configuration type is one selected from the group consisting of (1) a copy on send configuration type, (2) a copy to pool on receive configuration type, (3) a copy to buffer on receive configuration type, (4) a push to pool on receive configuration type, (5) a push to buffer on receive configuration type, (6) a queue on send configuration type, (7) a copy to self configuration type, (8) a queue to self configuration type, and (9) an overwrite on send configuration type.

13. The apparatus of claim 9 wherein at least one channel's configuration has a user-redefinable maximum data transfer size.

14. The apparatus of claim 9 wherein at least one channel's configuration has a user-redefinable board memory allocation.

15. The apparatus of claim 9 wherein at least one channel's configuration is user-redefinable with respect to whether a data transfer over the bus is a DMA data transfer.

16. The apparatus of claim 9 wherein the communication utility is user-redefinable with respect to the number of channels through which data is communicated.

17. The apparatus of claim 9 wherein the communication utility is redefinable with respect to the number of data processing boards within the apparatus.

18. The apparatus of claim 17 wherein the communication utility is user-redefinable to define a number of data processing boards for the apparatus that is larger than the number of data processing boards actually used by the apparatus.

19. The apparatus of claim 7 wherein the first data processing board, the second data processing board, and the bus are implemented in a helmet for a pilot.

20. A method of communicating data comprising:

defining, according to user input, a redefinable communication channel configuration for communicating data over a bus between a first data processing board and a second data processing board;

communicating data according to the defined communication channel configuration from one board to the other over the bus.

21. The method of claim 20 wherein the defining step comprises defining, according to user input, a plurality of redefinable communication channel configurations for a

plurality of communication channels, and wherein the communicating step comprises communicating data from one board to the other over the bus according to the defined communication channel configurations.

22. The method of claim 21 wherein the defining step comprises defining each communication channel's configuration separately.

23. The method of claim 21 wherein the defining step comprises selecting, for at least one channel, one of a plurality of available configuration types.

24. The method of claim 23 wherein the selecting step comprises selecting a communication channel's configuration type from the group consisting of (1) a copy on send configuration type, (2) a copy to pool on receive configuration type, (3) a copy to buffer on receive configuration type, (4) a push to pool on receive configuration type, (5) a push to buffer on receive configuration type, (6) a queue on send configuration type, (7) a copy to self configuration type, (8) a queue to self configuration type, and (9) an overwrite on send configuration type.

25. The method of claim 22 wherein the defining step further comprises allocating, according to user input, board memory for each of the communication channels.

26. The method of claim 22 wherein the defining step further comprises defining a maximum data transfer size for at least one communication channel.

27. The method of claim 22 wherein the defining step further comprises, for at least one communication channel, defining the conditions under which it uses DMA to transfer data over the bus.

28. The method of claim 22 wherein the defining step further comprises defining the number of communication channels.

29. The method of claim 22 wherein the defining step further comprises defining a data processing board capacity for the bus.

30. The method of claim 20 wherein the communicating step comprises communicating the data from one board to the other over the bus with a bus utilization percentage in a range of approximately 13% to approximately 25% for 8 Kbytes data transfers across the bus.

31. The method of claim 30 wherein the defining step comprises defining, according to user input, a plurality of redefinable communication channel configurations for a plurality of communication channels, and wherein the communicating step comprises communicating data from one board to the other over the bus according to the defined communication channel configurations.

32. The method of claim 31 wherein the defining step comprises defining each communication channel's configuration separately.

33. The method of claim 20 wherein the boards are VME boards and wherein the bus is a VME bus.

34. A method of configuring a communication utility for transporting data from a first processor to a second processor over a bus, the method comprising:

defining a configuration for a channel through which data is communicated over a bus by a communication utility interfacing at least a first processor with a second processor; and

in accordance with the defined channel configurations, compiling software for controlling the communication utility.

35. The method of claim 34 wherein the channel configuration is redefinable.

36. The method of claim 35 wherein the defining step comprises defining a plurality of redefinable configurations for a plurality of channels through which data is communicated by the communication utility.

37. The method of claim 36 wherein the defining step further comprises selecting a configuration type for each channel from a plurality of available configuration types.

38. The method of claim 37 wherein one of the available configuration types is a copy on send configuration type.

39. The method of claim 37 wherein one of the available configuration types is a copy to pool on receive configuration type.

40. The method of claim 37 wherein one of the available configuration types is a copy to buffer on receive configuration type.

41. The method of claim 37 wherein one of the available configuration types is a push to pool on receive configuration type.

42. The method of claim 37 wherein one of the available configuration types is a push to buffer on receive configuration type.

43. The method of claim 37 wherein one of the available configuration types is a queue on send configuration type.

44. The method of claim 37 wherein one of the available configuration types is a copy to self configuration type.

45. The method of claim 37 wherein one of the available configuration types is an overwrite on send configuration type.

46. The method of claim 37 wherein one of the available configuration types is a queue to self configuration type.

47. The method of claim 36 wherein the defining step further comprises selecting a maximum data transfer size for a channel.

48. The method of claim 36 wherein the defining step further comprises allocating memory space to a channel.

49. The method of claim 48 wherein the allocating step comprises selecting at least one from the group consisting of (1) a receive queue size for a channel, (2) a receive pool size for a channel, (3) a transmit pool size for a channel, and (4) a push queue size for a channel.

50. The method of claim 36 wherein the defining step further comprises defining the conditions under which a channel uses a DMA data transfer.

51. The method of claim 36 wherein the defining step further includes defining the number of channels through which data is communicated.

52. The method of claim 36 wherein the first processor resides on a first VME board, wherein the second processor resides on a second VME board, and wherein the bus is a VME bus.

53. The method of claim 36 wherein the defining step further comprises defining the channel configurations according to data entry by a user via a graphical user interface (GUI).

54. A device comprising:

a user interface through which a user provides configuration data; and

a processor configured to receive the configuration data from the user interface and generate a configuration file therefrom, the configuration file comprising configuration information for a plurality of channels over a bus that interconnects a plurality of data processing boards.

55. The device of claim 54 wherein the user interface is a graphical user interface (GUI).

56. The device of claim 55 wherein the GUI is configured to allow the user to define the number of channels through which data is communicated over the bus.

57. The device of claim 55 wherein the GUI is configured to allow the user to define a configuration type for each channel.

58. The device of claim 57 wherein the GUI is further configured to (1) display a list of available user-selectable configuration types for each channel, and (2) receive user input corresponding to a selection of a configuration type from the list for a channel.

59. The device of claim 55 wherein the GUI is configured to allow a user to define a maximum data transfer size for each channel.

60. The device of claim 55 wherein the GUI is configured to (1) display a memory allocation for each channel, and (2) receive a modification to a channel's memory allocation from the user.

61. The device of claim 55 wherein the GUI is configured to (1) display the conditions under which a channel is to use DMA

during data transfers over the bus, and (2) receive a modification to the conditions under which a channel is to use DMA during data transfers over the bus.

62. The device of claim 55 wherein the GUI is configured to, in response to user input, generate software in accordance with generated configuration file, the software defining how data is communicated over the bus between the boards.

63. A device comprising:

a user interface through which a user specifies a stored configuration file, the configuration file comprising configuration information for a plurality of channels over a bus that interconnects a plurality of data processing boards; and

a processor configured to retrieve the specified configuration file and generate software in accordance with the retrieved configuration file, the software for controlling data communications over the bus between the boards.

64. The device of claim 63 wherein the user interface is a UNIX command line interface.

65. A computer-readable medium comprising:

a plurality of instructions that are executable by a computer for managing data communication over a bus between a first data processing board and a second data processing board, the one or more instructions defining how the board's communicate data therebetween over the bus through a plurality of communication channels, wherein at least one of the communication channels possesses a redefinable configuration.

66. A computer-readable medium comprising:

a plurality of instructions that are executable by a computer for presenting a user interface on the computer through which a user provides configuration data; and

a plurality of instructions that are executable by the computer for receiving configuration data from the user interface and generating a configuration file therefrom, the configuration file comprising configuration information for a plurality of channels over a bus that interconnects a plurality of data processing boards.